Oct. 27, 1942. R. E. OTTENHEIMER 2,299,763

CABINET

Filed Aug. 4, 1938 4 Sheets-Sheet 1

Fig. 1.

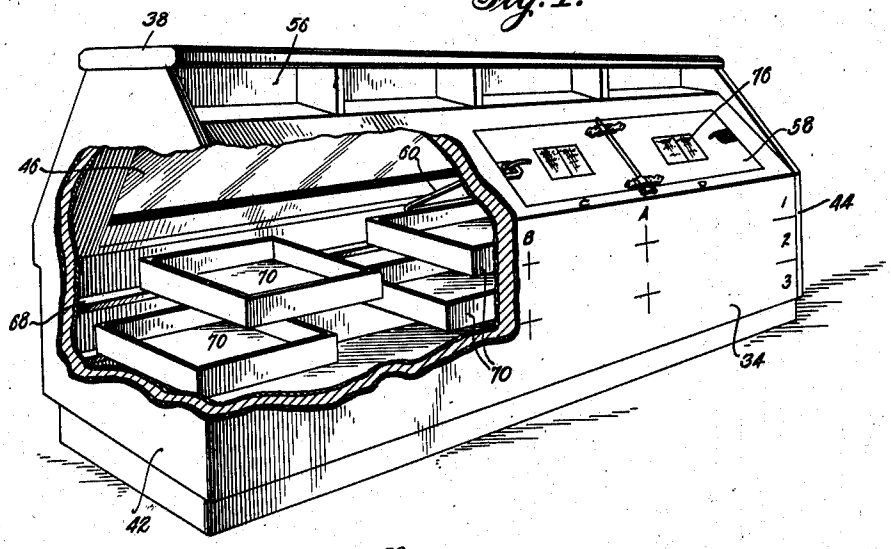
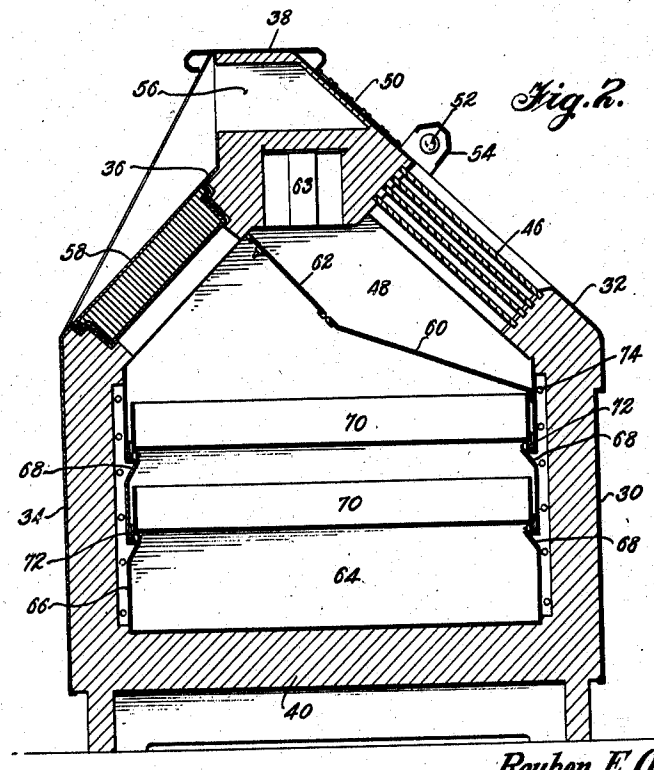


Fig. 2.



Inventor

Reuben E. Ottenheimer

By Raymond W. Colton

Attorney

Oct. 27, 1942. R. E. OTTENHEIMER 2,299,763

CABINET

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Fig. 4.

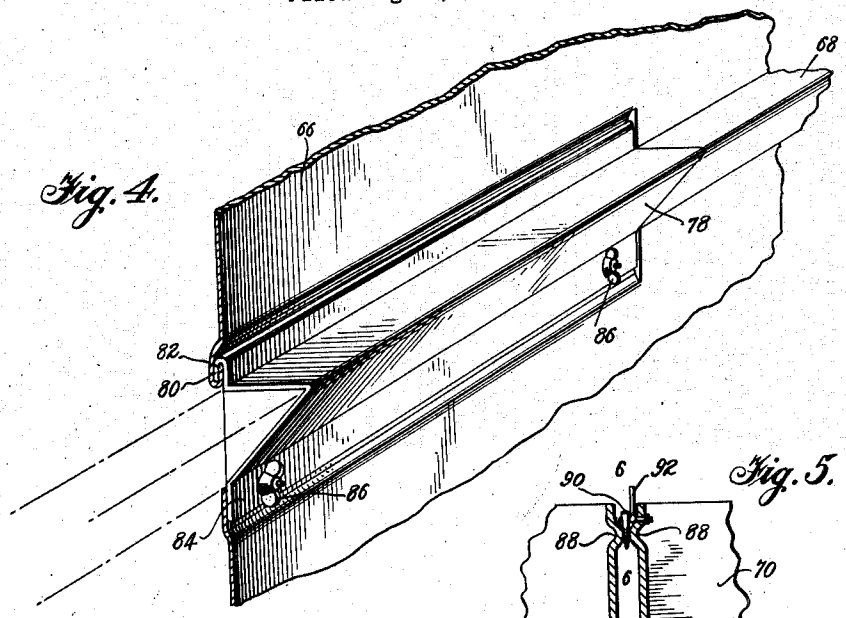


Fig. 5.

Fig. 3.

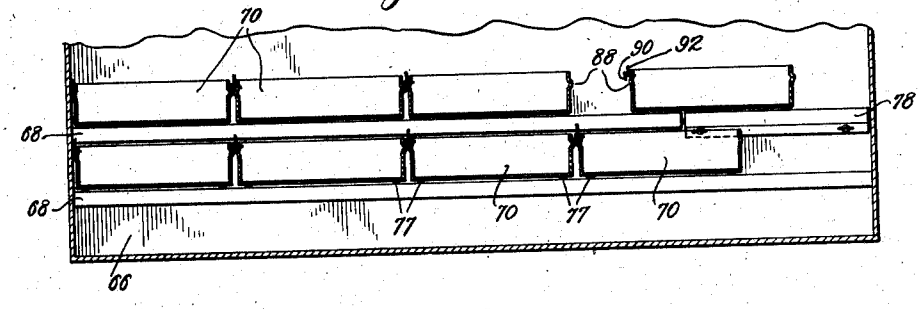


Fig. 7.

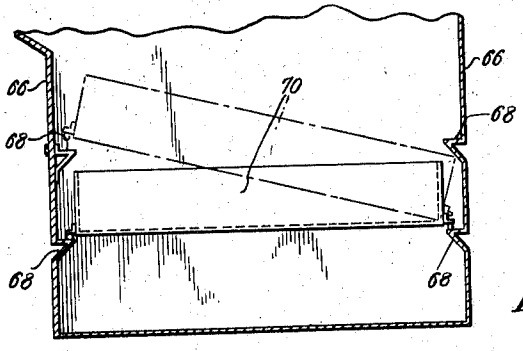
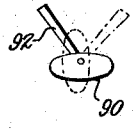


Fig. 6.



Inventor

Reuben E. Ottenheimer

By Raymond Wolfson

Attorney

Oct. 27, 1942. R. E. OTTENHEIMER 2,299,763

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Fig. 8.

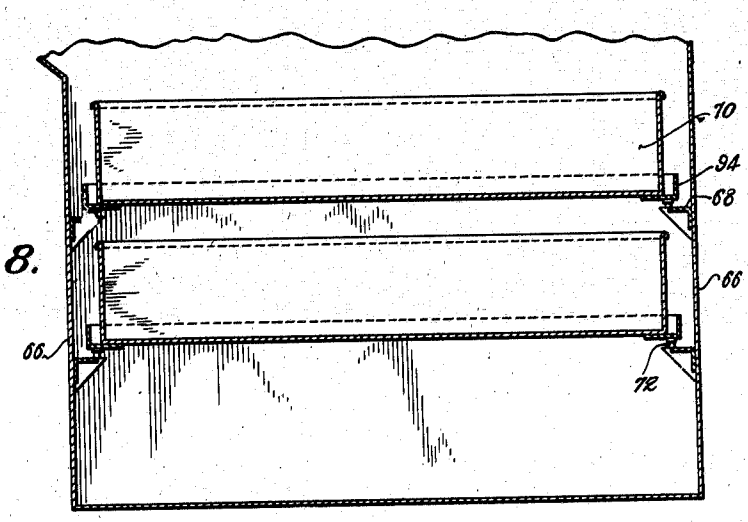


Fig. 9.

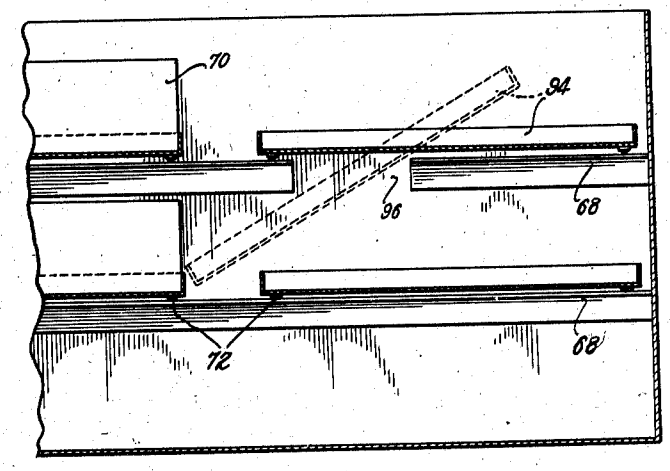
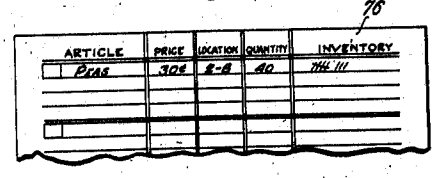


Fig. 11.



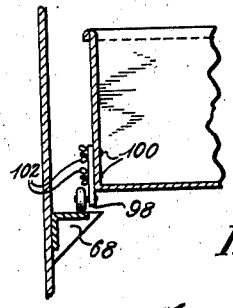


Fig. 10.

Inventor

Reuben E. Ottenheimer

By Raymond Wolter

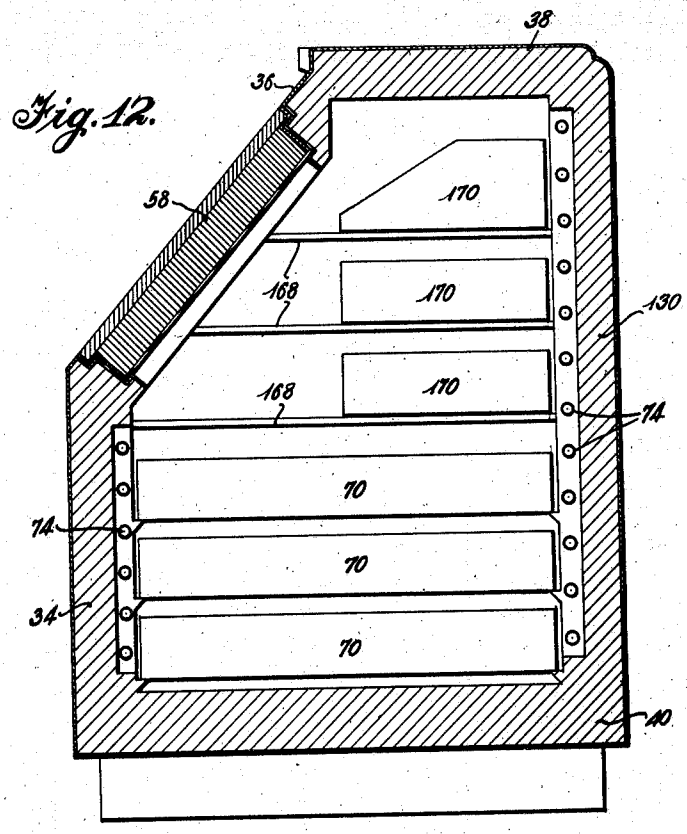
Attorney

Oct. 27, 1942. R. E. OTTENHEIMER 2,299,763

CABINET

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Fig. 12.



Inventor
Reuben E. Ottenheimer

By Raymond W. Cotton
Attorney

Patented Oct. 27, 1942

2,299,763

UNITED STATES PATENT OFFICE

2,299,763

CABINET

Reuben E. Ottenheimer, Baltimore, Md.

Application August 4, 1938, Serial No. 223,109

8 Claims. (Cl. 312—119)

This invention relates to cabinet structures, especially those of the type adapted to the vending of foodstuffs.

Cabinets combining display and storage features are of course well known in the field of refrigerated show cases and have been used for years in the merchandising of foods such as meats and dairy products, where the temperatures maintained are usually below atmospheric but above freezing. It has also been proposed in prior practice to employ sliding trays or receptacles in such constructions in order to facilitate the handling of the goods and to increase the accessibility of various portions of the cabinets. Typical examples of structures of these types will be found in the patents to Rutishauser, 1,845,888, issued February 16, 1932; Fritz et al., 1,924,118, issued August 29, 1933; Knapp, 1,979,625, issued November 6, 1934; and Thomas et al., 2,032,234, issued February 25, 1936.

In most of the instances in which sliding trays have been utilized in the storage compartments of these known constructions, separate sets of closures have been provided for the display and storage portions, necessitating many breaks in the insulating walls, thus affording an excessive number of potential points of leakage and proportionately increasing refrigeration losses. Where common closures have been utilized for access to the display and storage compartments they have assumed, in most cases, the form of vertically hung doors. Opening such doors induces large volumes of cold air to escape to atmosphere and closing the same forces atmospheric or ambient air into the cabinet. Large temperature drops within the cabinet result from such constructions, at the expense of general efficiency. Where a purely horizontal top opening has been used in cabinets of this general type, the display compartment is difficultly accessible at best, and in one such instance, it has been necessary to employ a display compartment which is removable from its normal position in order to insert or remove the articles for display.

The disadvantages of constructions of the type already considered will be greatly increased at lower storage temperatures, such as those maintained in preserving frosted or frozen foods. Whereas the frosted food industry has been developing steadily for a number of years, thus far, no satisfactory combined display and storage cabinet has been produced to cope with the problems of adequate display, low storage temperature, accessibility, and arrangement and location of the relatively large numbers of items which for reasons of economy, must be stored within a limited space.

Whereas none of the combined display and storage cabinets thus far discussed has contemplated a compartment adapted to receive superposed horizontal tiers of receptacles, the present inventor is familiar with "blind" or ice cream type cabinets where receptacle arrangements of this general type have been proposed. Examples of such constructions appear in the patents to Cocks et al., 1,978,565, issued October 30, 1934; Cocks, 2,076,173, issued April 6, 1937; Crisman, 2,112,015, issued March 22, 1938; and Crisman, 2,112,482, issued March 29, 1938. Inasmuch as all of these known blind cabinets contemplate horizontal top closures, they provide no compartments for the display or storage of goods above the shiftable receptacles.

Further regarding the previously proposed constructions dealing with superposed tiers of sliding or otherwise movable trays, receptacles, or supports utilized in cabinets of the type under consideration, it will be noted that in attempting to utilize as much of the available volume as possible, it has been found necessary to resort to complex suspensions or collapsible constructions for the trays or receptacles. One of the principal objections which has been raised to the use of the sliding constructions of the prior art, has been the binding of adjacent receptacles due to freezing of moisture within the cabinets. Moreover, in order to take full advantage of available space, such sliding arrangements have required assembly of the supports or receptacles within the cabinets themselves, an operation which will be performed, in most cases, "on the job" at the expense of economy and workmanship. More recent workers in the art have sought to overcome there objects through the use of pivoted constructions, but these in turn are not entirely satisfactory because of their increased number of working parts and the requirement of the clearance in the cabinet to accommodate the arcuate paths of the receptacles and their supports, not to mention the burden imposed upon the salesperson of lifting the weight of the elements to be shifted.

It is proposed by the present invention to eliminate the inherent faults and disadvantages of prior art constructions, while retaining their more desirable features.

The present cabinet is especially adapted to the storage and vending of perishable articles such as foodstuffs, and lends itself admirably to the merchandising of frosted or frozen foods.

In one form it combines a glazed display compartment and horizontal superposed tiers adapted for the reception of slidable or otherwise movable receptacles. In each of the upper tiers, the space occupied by the receptacles to be inserted will be less than the tier capacity by an amount sufficient to permit access by the vendor to the lower tier or tiers. In this manner the receptacles in the upper tier or tiers may be shifted to render accessible every point in the lower tier or tiers. In some cases it will be desirable to render it convenient for a salesperson standing on the floor adjacent the cabinet to reach into any part of the display and/or storage portions of the cabinet for the insertion or removal of goods, which may be accomplished by the provision of an inclined upper wall containing a suitable closure or closures whose bottom edges are arranged below the arm-pit level of an adult of average height. Such disposition of the closure thus permits ready access to the upper storage or display and lower storage compartments through a common opening, maintaining leakage at a minimum, and since the closure is inclined to the vertical, it does not introduce substantial losses due to convection upon the opening and closing thereof.

The proposed invention also contemplates a blind type of cabinet wherein an inclined upper wall contains a door giving access to superposed rows of horizontally movable receptacles as in the case of the display type of cabinet. In this form however, a compartment or space is provided above the upper tier of receptacles for the reception of articles to be vended, and especially such articles for which there may be such great demand that it is desirable that they be even more accessible than those in the tiers below. This upper compartment may suitably contain a plurality of rows of superposed receptacles, movable transversely of the cabinet so that they can be brought to a position near the door or shifted to a point remote therefrom. In any event, the articles stored in this upper compartment preferably will be arranged at all times to be within an arm's length of an adult of average proportions reaching through the door. In this manner, all of the available space within such a cabinet will be within ready reach, either downwardly or outwardly, of an adult of average size.

A track construction carried by the cabinet, equally applicable to cabinets of the display or blind type above described or in general is used to support at least the upper tier or tiers of receptacles. To facilitate insertion of the receptacles into a lower tier, the track may be provided with a gap or discontinuity through which the receptacles may be passed. Suitable surfaces may be formed on the receptacles or trays therefor, for sliding or rolling contact with the track. Such surfaces may assume the form of skids, rollers, casters, or they may be merely projections. An alternative construction for insertion of the receptacles through and beyond the track contemplates the use of a demountable sliding surface on the receptacle, which surface constitutes only one or perhaps two elements to be attached after the receptacle has been introduced to its ultimate position within the cabinet. In some instances where the discontinuous track is employed, it is desirable to bridge the discontinuity with a removable track section after the required number of receptacles have been introduced therethrough into the lower tier or tiers.

The movable units, whether they be receptacles or merely frames or trays for supporting receptacles preferably have certain of their vertical walls formed with projections to provide relatively small contact areas with abutting surfaces and thus reduce the tendency of binding between adjacent units or between a unit and a wall of the cabinet. In the event of freezing, such elements confine the film of ice to be broken to a less extensive area than would be otherwise encountered. Moreover, such projections in the form of beads or ridges will possess sufficient inherent resiliency to absorb shocks and serve as bumpers for the receptacles. As a further means of facilitating separation of slidable units in the event of binding from freezing, levers may be provided to operate wedge or cam elements which in turn, serve to dislodge the receptacle from an adjacent wall to which it has adhered.

Suitably locating the goods within cabinets of the present type has likewise raised a problem, especially, as in the case of frozen foods, where a large number of different items are to be vended. This contingency has been met by marking the exterior portions of the cabinet to indicate the interior arrangement of tiers and columns. Index cards are also provided in cooperation with such markings to designate the position of a particular item with regard to the receptacle, tier and column in which it is located. Additional data such as price, inventory, etc., may likewise appear on such index cards.

A more complete understanding of the present invention will be had after consideration of the description in conjunction with the attached drawings wherein:

Fig. 1 is a perspective view, partly broken away, of a cabinet embodying the present invention;

Fig. 2 is a sectional elevation of the cabinet shown in Fig. 1;

Fig. 3 is a longitudinal elevation in section of a portion of the cabinet;

Fig. 4 is a perspective view, partly broken away, illustrating a removable track section;

Fig. 5 is a fragmentary section illustrating a detail;

Fig. 6 is an elevation showing the wedge or cam member of Fig. 5;

Fig. 7 is a sectional elevation of a portion of the cabinet showing the manner of assembly of certain elements;

Fig. 8 is a transverse sectional elevation of a modification depicting two tiers of receptacles and sliding supports therefor;

Fig. 9 is a fragmentary longitudinal elevation in section, showing the manner of insertion of the supports of Fig. 8;

Fig. 10 is a sectional elevation, partly broken away, showing a further modification;

Fig. 11 is a plan view of a portion of an index card for use with the present invention; and

Fig. 12 is an elevation of a modification.

One form of cabinet embodying the present invention as shown in Fig. 1, comprises an insulated box having a lower vertical front wall 30 which joins an upper front wall 32, and a vertical rear wall 34 merging into a forwardly inclined rear wall 36. The pair of walls 32 and 36 may be said to define upper front and rear walls respectively of the cabinet since they converge towards its top 38. The base of the cabinet is closed by a bottom wall 40 and the ends are defined by end walls 42 and 44.

As described in applicant's companion appli-

cation, Serial No. 195,396, filed March 11, 1938, the upper front wall **32** is provided with a multiglazed window or panel **46** through which the contents of a display compartment **48** may be viewed by a customer. Also mounted on the front wall, and shown as above the display window, there is provided a sign supporting surface **50** adapted for the reception of removable sign elements. A light source **52** is positioned intermediate the display window and sign supporting surface to serve as a common source of illumination. A reflector **54**, suitably mounted on the cabinet, partially surrounds the light source to assure proper distribution of light. Behind the sign supporting surface and below the top **38**, a compartment **56** is formed for the purpose of storing wrapping materials, literature, etc., connected with the sale of the goods being vended from the cabinet.

The inclined rear wall **36** is provided with a suitable number of closures **58**, their number depending upon the length of the particular cabinet. In closed position, the closures or doors **58** are substantially coplanar with the wall in which they are located and thus define an acute angle to the horizontal.

In some instances, especially where it is desired that the cabinet serve simultaneously as a counter over which dealings may be transacted between a salesperson and customer, the overall height of the cabinet may be such that the top will be below the eye level of an adult of average height or at least low enough to enable such persons to reach over it. In such event, the lower edges of the doors or closures will be arranged, preferably below the arm-pit height of such an adult of average height to permit the salesperson to gain complete access to the interior of the cabinet. It will be evident however, that many conceivable constructions embodying various phases of the present invention will not require such an overall height or door arrangement, both of which may vary appreciably to suit individual demands.

The display compartment **48** is separated from the remaining portion of the interior of the cabinet by means of a partition **60**, provided with a door or doors **62** hinged thereto. In the upper portion of the display compartment, preferably out of the line of vision of a customer standing adjacent thereto, there is a refrigerating element **63** serving to maintain the temperature within the display compartment at the desired value. The interior portion of the cabinet below the display compartment constitutes a storage compartment **64**. The longitudinal walls of the storage compartment may be lined by a metal wall **66** having formed integrally therewith or attached thereto, a plurality of tracks **68** for supporting one or more tiers of slidable receptacles **70**.

The receptacles or supports therefor are constructed to extend across the storage compartment and they are provided with sliding surfaces **72** for engagement with the oppositely disposed tracks **68**. As shown in Figs. 1 and 2, the supports or receptacles have been arranged in two tiers, superimposed horizontally, and below the lower tier a space has been provided for the storage of goods upon the floor of the cabinet. It will be understood that receptacles may also be provided in the lowermost portion of the cabinet and that the number of tiers may be varied to suit the needs arising in conjunction with any particular type of goods to be vended. In order to facilitate access to the lower tier or to the space therebelow, each tier will preferably comprise supports or receptacles which do not consume all of the available space, leaving a gap of sufficient size to permit access between them to the lower tier or tiers. Accordingly, the receptacles can be shifted longitudinally, or transversely if desired, of the cabinet in either direction so that it will be possible to reach through the door **58** into any desired portion of the storage compartment. Between the lining **66** and the vertical walls **30** and **34**, suitable cooling elements **74** have been depicted. These cooling elements are preferably designed to maintain the temperature of the storage compartment at a point adequate for the preservation of the goods to be stored.

Inspection of Fig. 1 of the drawings will illustrate the contemplated manner of indexing the cabinet of the present invention in order that the salesperson can immediately locate the position of an article for sale. The vertical rear wall **34** has been marked exteriorly to designate tiers **1**, **2** and **3** and to designate columns A, B, C, etc. Mounted on a suitable portion of the cabinet, convenient for inspection by the vendor, index cards **76** have been provided, and as shown in detail in Fig. 11, contain data concerning the price, location, quantity and inventory of each article for sale. Under the heading of location, a numeral may designate the tier in which the article is located and a letter the column in which it will be found.

In Fig. 3 of the drawings, the arrangement of receptacles or supports **70** has been depicted, wherein suitable pressed or otherwise formed projections **77** serve as sliding surfaces for riding upon the track or rail **68** mounted on the compartment wall **66**. Each track above that for the lowermost tier into which receptacles are to be positioned, is provided with a removable section **78** of a length sufficient to permit a receptacle or support **70** to be passed therethrough into a lower tier. One form of construction suitable for the purpose has been shown in Fig. 4 of the drawings wherein the upper edge of the removable track section is folded to form a downwardly directed edge **80** for cooperation with an upturned flange **82** formed on the wall **66** of the storage compartment. The lower edge of the removable track section may be provided with a flange **84**, suitably perforated for the reception of bolts, by which it is fastened to the wall by means of winged nuts **86** or the like. The manner of inserting a support or receptacle into such a construction will be clear from the showing in Fig. 7 of the drawings wherein the broken lines indicate the receptacle as it is being lowered to its final position through a discontinuous portion of the uppermost track **68** located at the left hand side of the figure. The final position of the receptacle is shown in full lines, the opposed sliding surfaces resting upon the tracks provided at the opposite sides of the compartment.

Also shown in Fig. 3 of the drawings and in larger detail in Fig. 5, the transverse walls of the receptacles are provided with bumps or beads **88**, which may be pressed or otherwise formed therein to provide reduced abutment areas and thus facilitate separation of the receptacles from adjacent walls to which they may become frozen, and to serve at the same time as bumpers to absorb shocks and protect the articles in storage as the positions of the receptacles are shifted in the cabinet. Tapered wedge or cam-like elements

90 may be pivoted to certain of the walls of the supports or receptacles 70 each of which may be provided with a handle or lever 92. Operation of these levers will serve to dislodge the receptacle or support from a wall or surface to which it may have become frozen due to the effect of the low storage temperatures upon moisture within the cabinet. Another view of the cam or wedge for effecting the separation is shown in Fig. 6 of the drawings. As clearly shown in Fig. 5 of the drawings, these wedges will preferably penetrate between the beads of contiguous receptacles.

Where the receptacles are carried by frames or tray-like supports, the receptacles may be suitably proportioned to be passed readily between the supporting tracks. In such a case however, some provision must be made for introducing the supports into the lower tiers. As shown in Fig. 8 of the drawings, the receptacles 70 are received in supports 94 which are in turn slidably mounted on the tracks 68 carried by the wall 66. In this construction, as shown in Fig. 9 of the drawings, the tracks are provided with a gap or discontinuity 96 having a length which is less than the longitudinal dimension of a support but of sufficient size to permit insertion of the support by turning it at an angle to the horizontal in the manner depicted in broken lines. It will be clear from the showing in Fig. 9, that when the tray 94 at the right end of the upper row is moved to the left, it will be permitted by the trays already in the tier to move only such a distance that its sliding surface at the right end thereof will not drop into the gap provided in the track. It will also be noted that when the tray is moved as far to the right as the wall of the cabinet will permit, the sliding surface at its left end will not fall into the gap.

The modification shown in Fig. 10 of the drawings contemplates a receptacle 70 having a detachable leg 98 for reception on the track 68. In this construction it will be clear, that the receptacle with its leg removed can be inserted to its position in one of the lower tiers, whereupon the mechanic can reach into the cabinet and attach the leg thereto by means of suitable screws 100 and winged nuts 102 as indicated in this figure.

The modification depicted in Fig. 12 of the drawings illustrates one way in which a blind type cabinet may be constructed to embody certain features of the present invention. This form is in many respects similar to that shown in the preceding figures and like reference characters have been used as far as possible.

In this modification the front wall 130 has been shown as vertical. It joins the top 38, the bottom wall 40 and suitable end walls similar to those shown in Fig. 1. The inclined portion of the rear wall 36 contains one or more doors 58 through which access may be had to the longitudinally slidable receptacles 70 positioned below the door. Cooling elements 74, diagrammatically shown, may be arranged in a desired manner.

Located above the uppermost tier of longitudinally movable receptacles 70, there is arranged one or more tiers of transversely movable receptacles or trays 170 mounted on tracks 168 which likewise extend transversely of the cabinet. These transversely movable receptacles are arranged so as to be within an arm's length of an adult of average proportions reaching through the door so that their contents will be readily accessible. In fact, the position of these transversely movable receptacles substantially opposite the door adapts them to support goods for which there may be greatest demand, since in some respects, the goods so disposed may be more accessible than the articles carried in the compartment below. In some cases, these upper receptacles may be fixed near the front of the cabinet to constitute in effect one or more shelves.

The operation of the cabinet shown in Fig. 12 will probably be evident from the foregoing description. With the transversely movable trays in the positions shown, the longitudinally movable trays will be manipulated as in the forms of the invention previously described. When it is desired to remove an article from one of the transversely movable trays, the door will be opened and the particular tray will be moved towards the rear of the cabinet to sufficiently expose its contents for selection of the desired article. The tray may then be restored to its position shown in the drawings, and others of the trays may be operated similarly.

The various examples shown and described in the foregoing are intended to illustrate the present invention but not to be restrictive thereof and the scope of this invention is to be measured only by the appended claims.

I claim:

1. A cold storage cabinet comprising an insulated box having closed sides and bottom adapted to contain superposed horizontal tiers of receptacles, an upper wall inclined at an acute angle to the horizontal, a door in said wall, a plurality of horizontally movable receptacles for an upper tier accessible through said door, the space occupied by the receptacles in said upper tier being less than the capacity of the tier to permit selective movement of the receptacles thereof for access to the tier below, tracks supporting the receptacles of said upper tier, said tracks providing a gap through which receptacles of a lower tier may be inserted and removed, the walls of said cabinet defining a storage space above said upper tier accessible from said door and a supporting surface provided in said storage space, said receptacles having a width greater than the space between said tracks.

2. A cabinet having closed sides and bottom and an upper wall containing closure means, a plurality of receptacles in said cabinet, spaced sliding surfaces on said receptacles, said cabinet being adapted to contain said receptacles in superposed horizontal tiers, discontinuous tracks carried by the cabinet above its bottom for slidably supporting an upper tier comprising a plurality of receptacles, said receptacles having a width greater than the space between said tracks, the discontinuity of said tracks permitting introduction of a receptacle into a lower tier, the space occupied by the receptacles to be inserted in said upper tier being less than its capacity.

3. A cabinet having closed sides and bottom and an upper wall containing a closure, said cabinet being adapted to contain superposed horizontal tiers of receptacles, a pair of tracks arranged on the sides of the cabinet above the bottom for slidably supporting an upper tier of receptacles, a plurality of receptacles in said upper tier, the space occupied by said receptacles in said upper tier being less than the capacity of the tier, said tracks including a removable section to permit the introduction of a receptacle into a lower tier.

4. A cabinet having closed side and bottom walls and an upper wall containing a closure, said cabinet being adapted to contain superposed

horizontal tiers of receptacles, a track comprising rails arranged in the cabinet above the bottom thereof for slidably supporting an upper tier comprising a plurality of receptacles, one of said rails containing a gap through which a receptacle may be inserted.

5. A cabinet having closed sides and bottom and an upper wall containing a closure, said cabinet being adapted to contain superposed horizontal tiers of receptacles, a track comprising rails arranged in the cabinet above the bottom thereof for slidably supporting an upper tier of receptacles, one of said rails containing a gap, the length of said gap being smaller than the width but greater than the depth of a receptacle to permit the introduction of a receptacle into a lower tier.

6. A substantially closed cabinet having an upper inclined wall containing a door, superposed receptacles movable in one direction within said cabinet and accessible through said door, and superposed receptacles within said cabinet movable in a direction substantially at right angles to the first said receptacles, arranged above the first said receptacles and likewise accessible from said door, a track comprising rails arranged in the cabinet above the bottom thereof for slidably supporting an upper tier of the first said receptacles, one of said rails containing a gap through which a receptacle may be passed.

7. A cabinet comprising a box having closed sides and bottom adapted to contain superposed horizontal tiers of receptacles, an upper wall inclined at an acute angle to the horizontal, a door in said wall, a plurality of horizontally movable receptacles for an upper tier arranged beneath said door, the space occupied by the receptacles in said upper tier being less than the capacity of the tier so as to permit selective movement of a receptacle thereof for access to the tier below, and a storage space substantially adjacent to said door above said upper tier and also accessible upon opening said door, a track comprising rails arranged in the cabinet above the bottom thereof for slidably supporting an upper tier of the first said receptacles, one of said rails containing a gap through which a receptacle may be passed.

8. A cabinet having closed sides and bottom and an upper wall containing a normally closed door, said door being inclined at an acute angle to the horizontal, the lowest point of said door being below the arm-pit height of an adult of average height, said cabinet being adapted to receive superposed horizontal tiers of movable receptacles beneath said door, the upper of said tiers to contain receptacles occupying a space less than the tier capacity, and a storage compartment containing a support above said upper tier arranged for the reception of articles within an arm's length of an adult of average proportions reaching through said door, a track comprising rails arranged in the cabinet above the bottom thereof for slidably supporting an upper tier of the first said receptacles, one of said rails containing a gap through which a receptacle may be passed.

REUBEN E. OTTENHEIMER.